

# Assessment of NIST Measurement and Standards Laboratories

NRC Board on Assessment of NIST Programs  
Fiscal Years 2004-2005

# Assessment Board charge

- Technical merit of the Laboratory programs relative to current state-of-the-art worldwide;
- Effectiveness with which the laboratory programs are carried out and the results disseminated;
- Degree to which the laboratory programs are meeting the needs for which they are intended;
- Adequacy of the Laboratory facilities, equipment, and human resources to support high quality technical programming.

# Board organization

- The Board
  - 5 at-large members + Panel chairs and co-chairs (15) = 20 members total
- The Panels

Building & Fire Research (16)	Mfg. Engineering (18)
Chemical Sci. & Tech (17)	Mats. Sci. & Eng'g (22)
Electronics & Elec. Eng'g (22)	Physics (24)
Information Technology (21)	
- 145 people: 58 from academia; 63 from industry; 17 from gov't; 7 “other”.

## The NRC “meta” charge

- Provide informal, constructive, direct feedback to NIST scientists and middle management (panel function).
- Provide a public, NRC-approved report useful for Laboratory, government, and public audiences (Board function).

# NIST's expanded mission

- “NIST promotes U.S. innovation and industrial competitiveness by advancing measurement science, standards, *and technology* in ways that enhance economic security and improve our quality of life.”
  - Metrology
  - Standards
  - *Enabling technologies*
- NIST's roles
  - Service organization: measurements; testing; instrument facilities
  - Data base developer and repository
  - World class, autonomous applied research laboratory

# Major NIST challenges

- Meeting the needs of emerging technological areas
  - Bio-sciences and bio-technologies
  - Nanotechnology
  - Environment
  - Information technology
- Responding to national crises requiring rapid testing, analysis
  - Twin Tower collapse
  - Rhode Island fire
  - Homeland security
- Balancing traditional service activities and new science
- Meeting the needs of new customers
  - The shift in innovation from large to small and medium-sized companies
  - The growing role of professional societies and trade groups in standards setting

# The NIST staffing challenge

- NIST's full-time permanent staff has decreased by 23% in 9 years and FTEs have decreased by 20% in that same time period. As a result:
  - Recruitment to meet the needs for expertise in the emerging technological areas is severely limited
  - Simultaneously maintaining traditional service activities and the research programs of a world class laboratory is challenged
  - Effective long-range planning for staff retirements and turnover is severely compromised
  - Morale in the professional staff remains very good, but these cuts cause some to express concern

# Major issues identified in NRC review: I

- Strategic foci
  - Identifying emerging areas and developing appropriate strategies for funding new research
  - Expanding the use of matrix management to promote cross-laboratory collaboration
  - Staffing problems: interdisciplinary versus multidisciplinary research
- Interinstitutional collaborations: successes and challenges

## Major issues identified in NRC review: II

- NIST at Boulder: new opportunities? A separate strategy?
- Balancing new science and traditional roles
  - The staffing issue
  - Developing criteria for setting priorities
- Effective dissemination strategies
  - Communicating to new audiences
  - Improvements in the use of information technology and the NIST website

## Conclusions

- From the report: “NIST carries out in a superb fashion an absolutely vital role in supporting as well as facilitating the further development of the technological base of the U.S. economy.
- Its personnel and scientific programs are, by scientific measures, among the best in the world, and its explicit and continuing attention to the needs of its customers keeps it alert to the changing technological environment to which it must be responsive”